

Variation of the Factors Responsible for the Secondary Subfertility Diagnosed by Diagnostic Laparoscopy at Arif Memorial Teaching Hospital, Lahore

MADIHA AFZAL, UZMA AZIZ, SAIMA QURBAN, SAMMAR HUSSAIN

Department of Obstetrics and Gynaecology, Rashid Latif Medical College/ Arif Memorial Teaching Hospital

Correspondence to Dr. Madiha Afzal, Email: madiha_tauseef@yahoo.com

ABSTRACT

Background: Secondary subfertility is defined as when a couple has had at least one prior pregnancy, is trying to get pregnant against but does not conceive after at least one year of trying. Various factors are found to be responsible for secondary subfertility like tubal, peritoneal, uterine, ovarian factors and use of diagnostic laparoscopy in secondary subfertility has been a focus of attention in recent years to evaluate these factors.

Aim: To explore these factors responsible for secondary subfertility by using laparoscopy as a diagnostic tool and determining the most common causative factor.

Methodology: This study was carried out at Department of Obstetrics and Gynaecology at Arif Memorial Teaching Hospital for a period of one year from January 2018 to December 2018. The total number of females participated in the study was 260, all with secondary sub fertility. The detailed history, general physical and abdominopelvic examination was done to detect any obvious pathology. The diagnostic laparoscopy was carried out in postmenstrual phase where all the pelvic viscera were examined under direct vision and then methylene blue dye test was done to check tubal patency.

Results: Out of 260 patients, 106(40%) cases of secondary subfertility belonged to age group 31-35 years. 58% cases had duration of 5-8 years of secondary subfertility. Out of 260 patients, 88(33%) had history of prior miscarriage. 16.5% patients have normal pelvic findings on diagnostic laparoscopy. 110(42%) patients had tubal factor found to be responsible for secondary subfertility followed by ovarian factor(19%), peritoneal factor(14%) and uterine factor(7%).

Conclusion: In our study, tubal factor is the most common cause of secondary fertility diagnosed by diagnostic laparoscopy with a previous history of miscarriage in such patients. So diagnostic laparoscopy should be recommended for accurate assessment of etiology of secondary sub fertility.

Key words: Secondary subfertility, Diagnostic laparoscopy, Tubal factor, Miscarriage

INTRODUCTION

Subfertility is as old as human race. Greek, Egyptians and ancient Asian cultures all had different remedies ranging from prayers and sacrifice to the indigenous drugs for the treatment. Even today such remedies are practiced in various uneducated committees. Childlessness is a tragedy to the married women that causes marital upsets as well as personal unhappiness and poor health¹.

According to ICMART-WHO, subfertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months of regular unprotected sexual intercourse². Primary subfertility implies if no previous pregnancies have occurred (3). Secondary subfertility is defined as the inability to conceive for one year despite exposure to pregnancy, after having conceived at least once before⁴.

The prevalence of subfertility in Pakistan is estimated to be 21.9% and secondary subfertility outnumbers the primary subfertility^{5, 6}. The prevalence of primary and secondary subfertility is nearly around 5% and 18% in Pakistan⁷. Resolve-national fertility association states that 3 million couples are unable to conceive for the second time⁸.

There is strong need to evaluate the couples suffering from secondary subfertility because secondary subfertility, although not life threatening, can have severe

consequences for the couples involved, especially for the female partner. If a woman cannot give birth to a living child in a formal union with a man after having previous conception, often she will be told to leave and is isolated and stigmatized in the wider community⁹.

We need to evaluate the various factors responsible for secondary subfertility because

- Even if a couple has history of previously proven fertility, various factors change with passage of time, e.g., fertility declines with the advancing age.
- To reach a diagnosis swiftly and provide appropriate management.
- The emergence of secondary subfertility can challenge even the strongest of marriages that can lead to distancing and alienation within the relationship.

Of the various factors responsible, the brunt of the problem in secondary subfertility is born by tubal factors, peritoneal factors, uterine factor, ovulation factor and previous obstetric outcome.

Experience has shown that majority of the pelvic pathology in secondary subfertility is not well appreciated by routine pelvic examination (10). Hence it is the prime responsibility of the gynaecologist to make a correct diagnosis of the causative factor of secondary subfertility and this has led to the emergence of diagnostic laparoscopy for evaluation of pelvic pathology in secondary subfertility. Laparoscopy offers the advantage of making

Received on 28-04-2019

Accepted on 03-08-2019

the diagnosis by acting as **Third eye of the gynaecologist** as it verifies all factors for secondary subfertility by direct manipulation of pelvic structures like uterus, fallopian tubes and ovaries by providing a panoramic view of the anatomy of the pelvis.

The rationale of conducting this study was to explore various factors based on laparoscopic evaluation responsible for secondary subfertility and determining the most common causative factor.

METHODOLOGY

This study was conducted in the department of Obstetrics and Gynaecology at Arif Memorial Teaching Hospital from January 2015 to December 2017. The total no of patients recruited in this study was 260 , all with secondary subfertility.

Inclusion criteria:

- All female patients of 20-40 years of age having secondary subfertility.
- Patients having normal husband semen analysis report.
- Duration of secondary subfertility minimum 12 months or more.
- Proven past fertility.

Exclusion criteria:

- Patients <20 years and > 40 years of age.
- Patients suffering from primary subfertility.
- Suboptimal husband semen analysis report.
- Patient unfit for anaesthesia due to medical comorbidity.

The protocol for the subfertility work up included detailed clinical history with respect to duration and nature of subfertility, menstrual history, past obstetrical history, medical, surgical, gynaecological, sexual history, details of previous tests and any treatment taken for secondary subfertility. Detailed general physical examination and abdominopelvic examination was done to detect any obvious pathology.

The requested investigations included Husband semen analysis, patients pelvic ultrasound, viral serology and hormonal profile including FSH,LH, Prolactin. TSH was requested only in patients with history and examination suggestive of the thyroid disorder. The patients were enrolled in the study after taking informed consent. Preoperative anaesthesia evaluation was carried out. Patient was kept NPO for 8-10 hours one night before the test. The diagnostic laparoscopy was performed by expert gynaecologist in postmenstrual phase under general anaesthesia through a single intraumbilical port. A second port was used for the mobilization of pelvic organs. After creating pneumoperitoneum with 1.5-2 L of CO2 gas, uterus, fallopian tubes, ovaries, round ligament, uterovesical pouch, pouch of Douglas were inspected for any pathology. The fallopian tubes were inspected for their length, shape, dilatation and fimbriae. The ovaries were inspected for their gross morphology, evidence of ovulation and their relationship with the fimbriae of the tubes. Periovarian, peritubal and omental adhesions, tubo ovarian mass, endometriotic spots, endometriotic cysts, fibroids and uterine abnormalities were noted. The patency of fallopian tubes was ascertained by injecting

methylene blue dye into the uterine cavity through the Rubin's cannula and observing it's spill through the fimbriae. The data was collected on a predestined Performa analysed on SPSS. Frequency and percentages were calculated.

RESULTS

Two hundred and sixty patients underwent diagnostic laparoscopy to evaluate the factors responsible for secondary subfertility. We distributed the cases with respect to age and found that 106(40%) cases of secondary subfertility belonged to age group 31-35 years. 90 (34%) cases of secondary subfertility belonged to age group 36-40 years. 42 (16%) cases of secondary subfertility were seen in 26-30 years age group and 22(8%) cases belonged to 20-25 years of age group.

With regard to the duration of secondary subfertility, 106(40%) cases of secondary subfertility had a duration of 5-8 years. 90(34%) cases had a duration of subfertility of 8-12 years. 46(17%) cases had a duration of subfertility of >12 years. Only 16(6%) cases had duration of secondary subfertility of 1-4 years.

Now there are the details for different factors contributing to secondary subfertility that were detected by diagnostic laparoscopy.

Tubal Factors in Secondary Infertility: Out of 260 cases recruited in the study, 110 cases(42%) had tubal factor found to be responsible for secondary subfertility. Of these 110 cases, 45 cases(17%) had bilateral tubal blockage, 10 cases (3.8%) had unilateral tubal blockage, 37 cases(14%) had 1 tube absent surgically due to history of salpingectomy because of ruptured ectopic pregnancy, 12 cases(4.6%) had hydro salpinx and 6 cases (2%) had tubo ovarian mass.

Ovarian factors responsible for secondary subfertility: Out of 260 cases of secondary subfertility, 50 cases (19%) had ovarian factor involved with 33 cases (12%) cases had polycystic ovaries, 11 cases(4.2) had endometriosis and 6 cases(2%) had tuboovarian mass.

Uterine and peritoneal factors responsible for secondary subfertility: Out of 260 cases of secondary subfertility, 20 cases(7%) had uterine factor involved with 16 patients(6%) had Fibroid uterus and 4 patients (1.5%) had some uterine anomaly seen. Out of 260 cases, 37 (14%) cases had peritoneal factor involved in the form of peritoneal adhesions.

Table 1: Case distribution with respect to age

Age (years)	Cases	%age
20-25	22	8
26-30	42	16
31-35	106	40
36-40	90	34

Table 2: Case distribution with respect to the duration of secondary subfertility

Age (years)	Cases	%age
1-4	16	3
5-8	106	58
8-12	90	28
>12	46	11

Table 3: Various factors contributing to secondary infertility

Age (years)	Cases	%age
Normal	43	16.5
Tubal factor	110	42
Ovarian factor	50	19
Peritoneal factor	37	14
Uterine factor	20	7

Figure 1: Past Obstetric Outcomes (n=260)

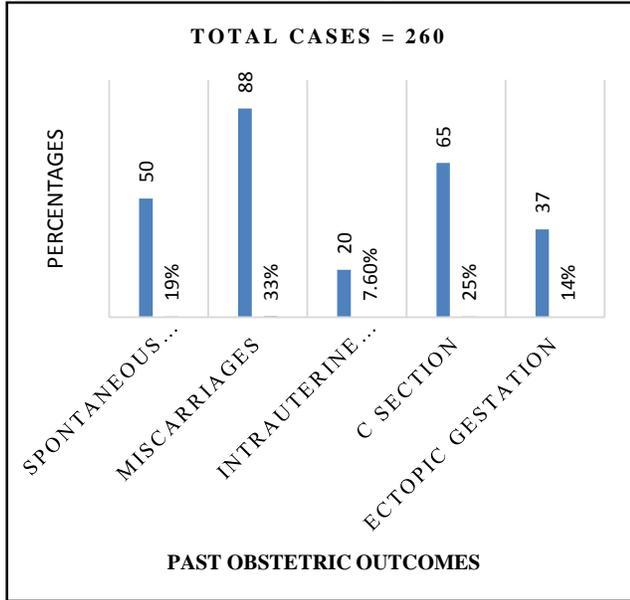


Fig. 2: Tubal Factors in Secondary Infertility

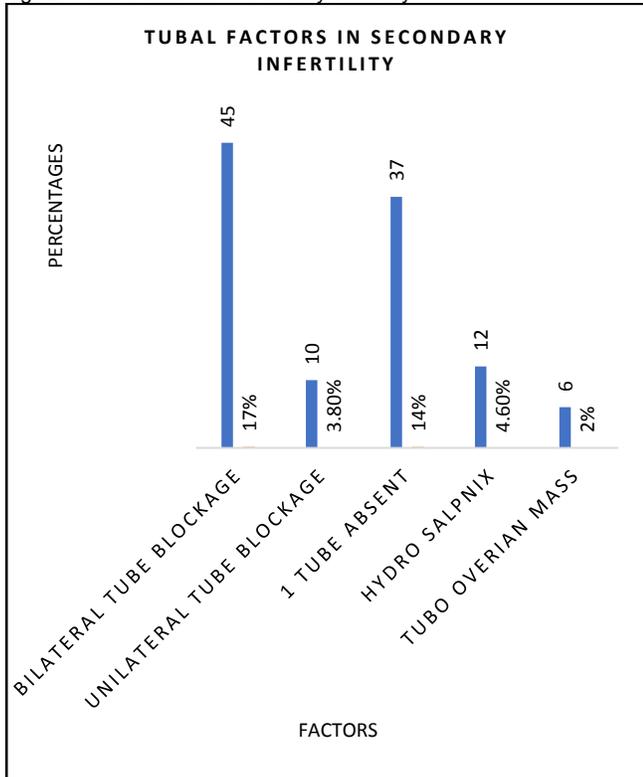


Fig. 3: Ovarian Factors responsible for secondary infertility

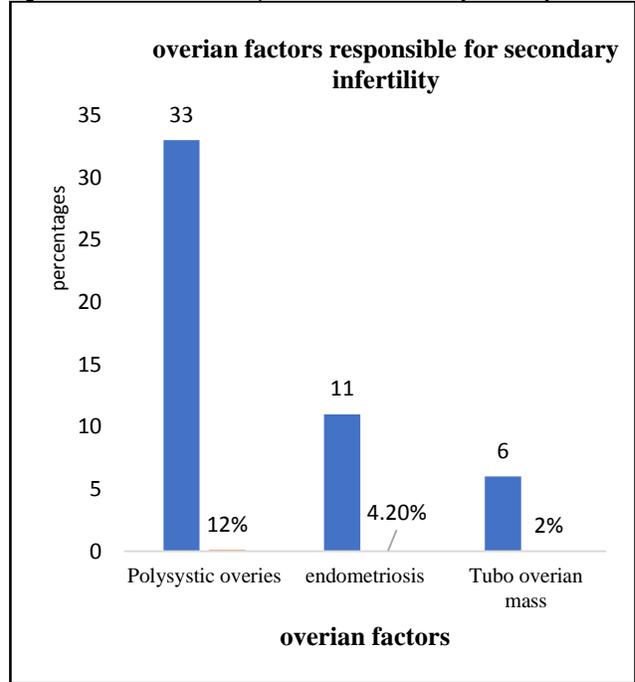
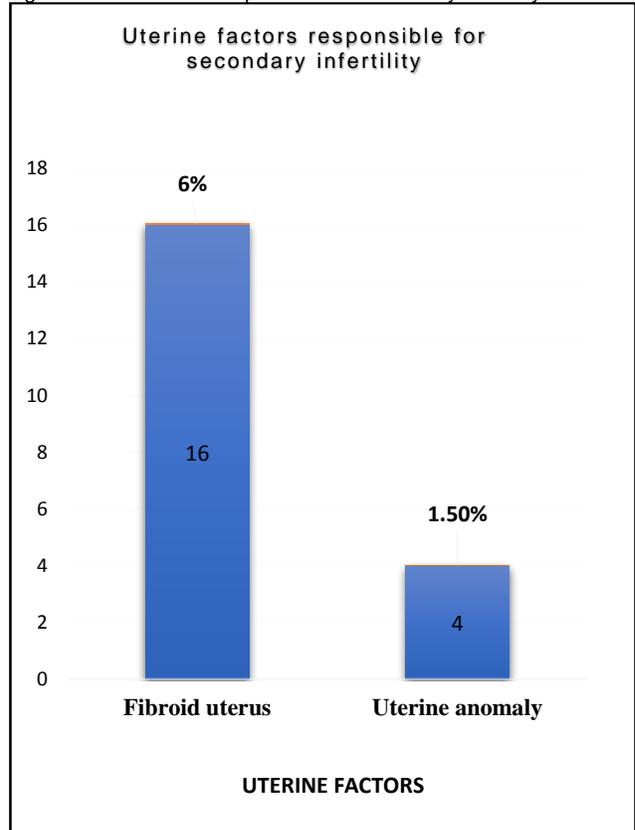


Fig. 4: Uterine factors responsible for secondary infertility



Percentage of various factors contributing to secondary subfertility

DISCUSSION

Evaluation of the female genital tract is one of the essential elements of subfertility assessment¹¹. Diagnostic laparoscopy is considered as gold standard for the full assessment and treatment of the subfertility¹². It provides information regarding the tubal status, ovaries, uterine pathology, any pelvic adhesions and has replaced certain old procedures like HSG in assessing tubal patency¹³.

We performed diagnostic laparoscopy in Arif memorial teaching hospital to evaluate the patients presenting with secondary subfertility in our set up as this procedure helps to reach accurate diagnosis by allowing direct manipulation of pelvic viscera, is time saving, requires minimal hospital stay and most of the causes of secondary subfertility could be ruled out in a single setting. We selected cases suffering from only secondary subfertility in our study as there is a dearth of information on the prevalence and causes of secondary subfertility in Pakistan¹⁴.

In our study, 40% patients of secondary subfertility belonged to the age group between 31-35 years which shows that the relationship of age and secondary subfertility is important. According to a study done by Krishna Menon, the cumulative female fertility potential declines after 30 years of age. So age is a crucial prognostic factor while assessing cases of secondary subfertility¹⁵. The centre for disease control (CDC) reports a 33% chance of subfertility by the age 40. Also it has been observed that about 1/3rd of the couples in which women is >35 years of age have fertility issues (16). NICE also recommends that subfertile women >35 years of age should be referred early from primary care for investigations and treatment¹⁷. Along with age factor, fertility potential can be decreased by the presence or worsening of endometriosis, uterine fibroids or PID that leads to decline in fertility with advancing age.

In our study, 58% patients had duration of secondary subfertility of 5-8 years that corresponds to the study done by Chaitra et al which showed that the 60% patients were suffering from secondary subfertility with a duration >5 years. Along with age, the duration of secondary subfertility influences the successful outcome in the treatment. Hutchins C.J states that women over 30 years of age with duration of secondary subfertility > 3 years or more should directly undergo laparoscopy after initial evaluation is complete¹⁸.

In our study, amongst 260 patients, 33% patients had history of previous miscarriage followed by subfertility. WHO says that one of the major reasons for secondary subfertility in developing countries is post abortal and postpartum infection that leads to tubal blockage. It has been observed that distal tubal blockage and adhesions are frequently observed on laparoscopy in patients with past history of abortion¹⁹. Dhont et al in his study observed that obstetric events especially unsafe abortion/curettage can attribute to secondary subfertility because of postpartum infection⁹.

In our study, 19% cases had ovarian factor found to be responsible for secondary subfertility which corresponds with the study conducted by Rekha et al²⁰. Laparoscopy is very helpful in direct visualisation of ovaries. It helps to

detect patients with PCOs, endometriomas and tuboovarian masses so that therapeutic manipulation can be done in same settings.

In our study, uterine factor was observed in 7% cases and peritoneal factor was seen in 14% cases of secondary subfertility which is in comparison with the study done by Rekha et al where it was found to be 10% and 20% respectively.

In this study, 42% cases had tubal factor identified as a cause of secondary subfertility which corresponds with the study done by Q wani et al showing 40% cases of tubal factor leading to secondary subfertility²¹. In our study, 17% cases had bilateral tubal blockage, 3.8% cases had unilateral tubal blockage, 14% cases had 1 tube surgically absent and 4.6% cases had hydrosalpinx showing PID.

PID leads to adhesions and tubal blockage and it is significant pathology in secondary subfertility in developing countries like ours. PID can be accurately diagnosed by laparoscopy. According to one study conducted by Gibson et al, women of 25-30 years of age were found to be subfertile in 19% cases after single episode of PID. This value increased to 31% and 60% after second and third episode of PID respectively.

In our study, abnormal laparoscopic findings were noticed in 82% patients while laparoscopy was found to be normal in 16.5% cases which corresponds with the study done by Chaitra et al who found abnormal laparoscopic findings in 79% cases of secondary subfertility¹⁸. So laparoscopy is considered to be superior than clinical examination in patients having pelvic adhesions, PID, endometriosis, PCOs. Direct visualisation of the fallopian tubes is the major advantage of diagnostic laparoscopy²². It is even superior to the ultrasound in detecting pelvic pathology responsible for secondary subfertility.

In our study, there were 33% cases of subfertility having previous history of miscarriage, 25% cases with history of previous Caesarean section and 14% cases with history of ectopic pregnancy followed by secondary subfertility. It is shown in literature that previous obstetric events Caesarean section, curettage, unsafe abortion can directly lead to subfertility by causing PID⁹. The relationship of previous ectopic pregnancy and salpingectomy followed by secondary subfertility could be explained partly by the antecedent pelvic infection so lower rates of subsequent fertility has been reported in these patients²³.

So tubal factor following pregnancy termination culminating into PID is the most common factor for secondary subfertility in our study. Tubal occlusion and peritubal adhesions are factors responsible for inhibition of ovum pickup and transport. Laparoscopy is the definitive way to diagnose them (Chaitra). This analysis is supported by the fact that developing countries like Pakistan have increased incidence of PID which affects fertility potential.

Laparoscopy not only helps in making diagnosis but also contributes in decision making. It should be considered earlier as a part of secondary subfertility evaluation in patients having risk factors for PID.

CONCLUSION

As diagnostic laparoscopy provides a panoramic view of the anatomy of the female pelvis and magnifies the view of

pelvic organs so now it accepted worldwide as a gold standard for diagnosing the tubal pathology, peritoneal factors, ovarian factors and intra abdominal causes of secondary subfertility. It also contributes to decision making of subfertility treatment. In Pakistan, we usually prescribe patients with secondary subfertility, ovulation induction without assessment of pelvic pathology by doing diagnostic laparoscopy that is not an appropriate step. Our study concluded that tubal pathology is the most common causative factor for secondary subfertility determined by diagnostic laparoscopy followed by ovarian, peritoneal and uterine factors. Tubal factor is most common here secondary to PID usually caused by post abortal sepsis. So it's our prime responsibility to promote health education about barrier contraception, signs and symptoms of PID and measures to adopt post abortal and post partum hygiene. So diagnostic laparoscopy should be recommended as the most sensitive and accurate diagnostic measure for assessment of aetiology of secondary subfertility.

Acknowledgments: The authors are thankful to Prof Sohail Khurshid Lodhi and Prof Yousaf Latif for their supervision and guidance in this article.

REFERENCES

1. Agarwal R, Mantri E, Agarwal N, Kumar M. Laparoscopic investigation of infertility in females of Western Rajasthan. *International journal of applied research* 2017;3(3):594-598.
2. Gurunath S, Pandian Z, Anderson RA, Bhattacharya S. Defining infertility, a systematic review of prevalence studies. *Hum Reproduction Update* 2011;17(5):575-88.
3. Yasir N, Parveen S, Tariq H, Fatima A. Laparoscopic findings of female infertility—a study of 186 cases at a tertiary care hospital. *Pak Armed Forces Med J* 2014;64(2):304-7.
4. Ara B, Zaibunnisa, Ara F, Baloch A. Diagnostic Laparoscopy for infertility; an accurate technique for evaluation. *Professional Med J* 2016;23(8):1005-1009.
5. Aziz Nosheen et al. Laparoscopic evaluation of female pelvis in infertility.
6. UNFPA. Pakistan population assessment, Islamabad: Government of Pakistan; 2003.
7. Aflatoonian A, Syed Hassani SM, Tabibnejad N. The epidemiological and etiological aspects of infertility in Hazard province of Iran. *Iranian J Reproduction Med* 2009;7:117-22.
8. Kuo Annie. Why conceiving again is not easy. *Resolve: The national infertility association*; March 31; 2017.
9. Dhont et al. The risk factor profile of women with secondary infertility: an unmatched case control study in Kigali, Rwanda. *BMC Women's Health* 2011;11:32.
10. Dhananjaya Shobha K et al. Role of diagnostic laparoscopy in evaluation of primary and secondary infertility. *J of evaluation of Med and Dent Sci* eISSN-2278-4802, PISSN-2278-4748/vol.3/ Issue 09/March 3, 2014.
11. Golditch IM. Laparoscopy: Advances and advances. *Fertil and sterilisation*. 1971;22(5):306-10.
12. Howkins and Bourne. *The pathology of conception*. Shaw's text book of gynaecology, 13th edition. Elsevier; 2004.
13. Has Talat et al. Laparoscopic evaluation in secondary infertility. *JCPSP* 2009, vol 19(11):704-707.
14. N Sami et al. Risk factors for secondary infertility among women in Karachi, Pakistan. *PLoS One* 2012;7(4):e 3528.
15. John A Collins. The better prognosis in secondary infertility is associated with ovulation disorders. *Fertility and Sterilisation*. 1986;45(5):611
16. Centers for disease control and prevention. *CDC 24/7: saving lives, protecting people, Reproductive Health* (30-3-17).
17. Krishna C et al. Laparoscopy as a diagnostic tool in evaluation of female factors in infertility. *International journal Reprod Contracept Obstet Gynecol* 2017;6(6):864-7.
18. Hutchins CJ. Laparoscopy and HSG in the assessment of tubal patency. *Obstet Gynae*. 1977;49:325.
19. WHO. Infection, Pregnancy and infertility. *Fertil and Steril*. 1987;47(6):964-5.
20. Rekha N et al. Evaluation of various factors in secondary infertility by diagnostic laparoscopy. *Int J Reprod Contracept Obstet Gynecol*. 2017 May;6(5):1972-1977.
21. A Wani et al. Diagnostic laparoscopy in the evaluation of female factors in infertility in Kashmir Valley. *Int J Women's Health Reproduction Sci* Vol.2, No. 2, Winter 2014 Supplement.
22. Kumar A K. Diagnostic laboratory in the evaluation of female factor infertility. *Int J Reprod Contracept Obstet Gynecol*, 2017;6(2):383-7.
23. Adekunle A Sonance. Factors influencing reproductive performance following previous ectopic pregnancy. *Saudi Medical Journal* 2000; Vol.21(12):1131.